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(54) Detecting dazzle

(57) Apparatus for detecting dazzle, e.g. for controlling drives of a dipping mechanism for a rearview mirror in motor vehicles, has sensors 8 and 9 for establishing the ambient brightness and the brightness of a source of glare connected to a differential device 23. A device 29 for setting the glare threshold values is connected to a comparator 26 to which the output of the differential device 23 is also connected. The output of the comparator 26 is passed through a delay device 41 to a drive 42 for controlling the drive 7 for dipping a rear view mirror 5. The threshold setting device 29 has a first adjusting element 31. If a signal indicating a dazzle effect is present at the output terminal 53 of the time-delay device 41, a second adjusting element 31 is activated via a switching element 34 to lower the threshold.

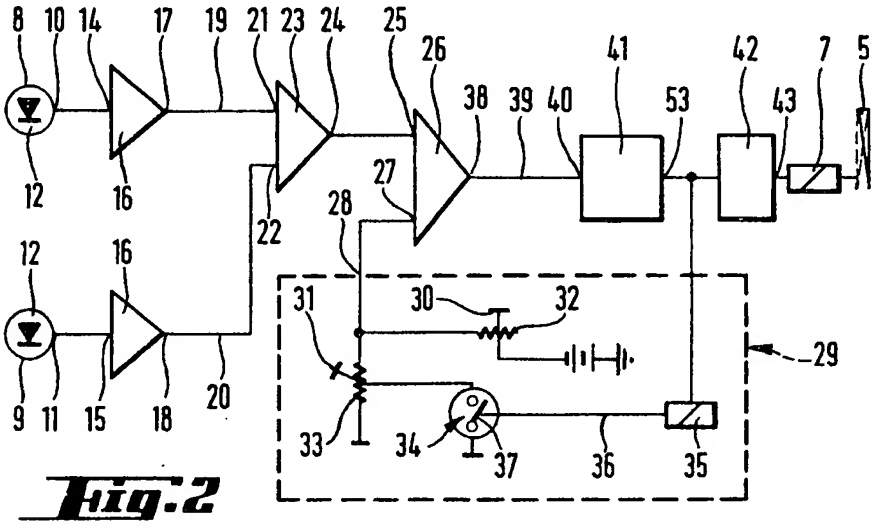

Fig.2

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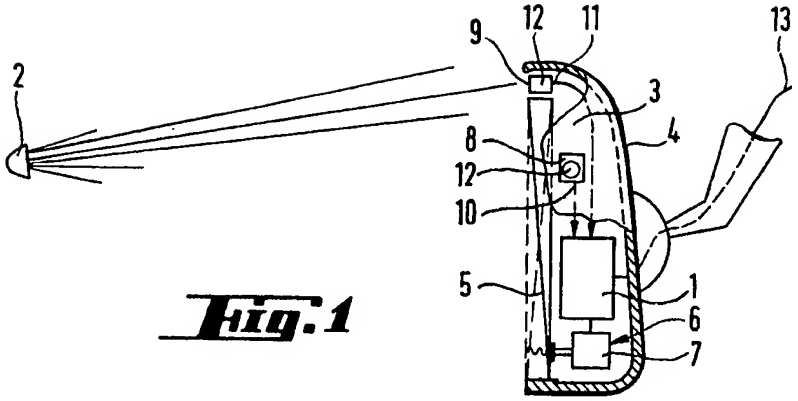

Fig.1

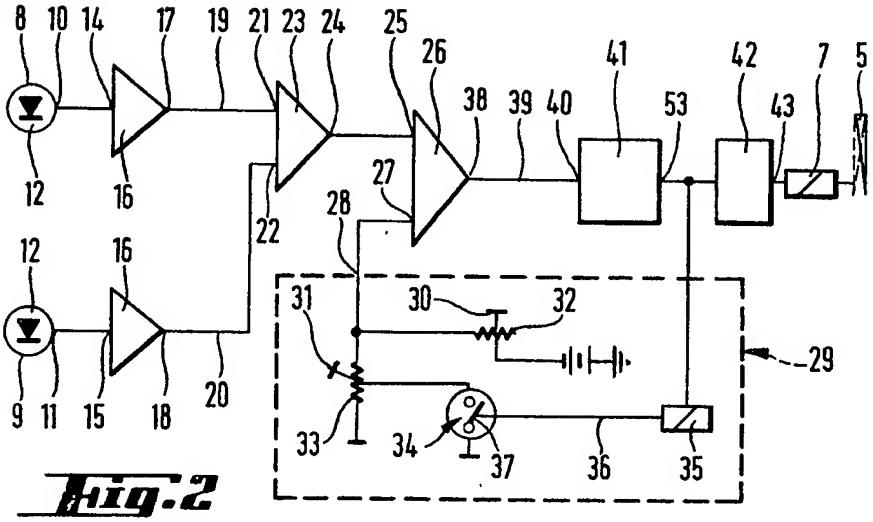

Fig.2

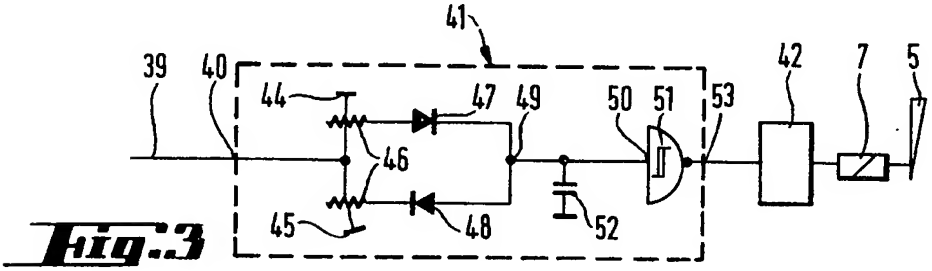

Fig.3

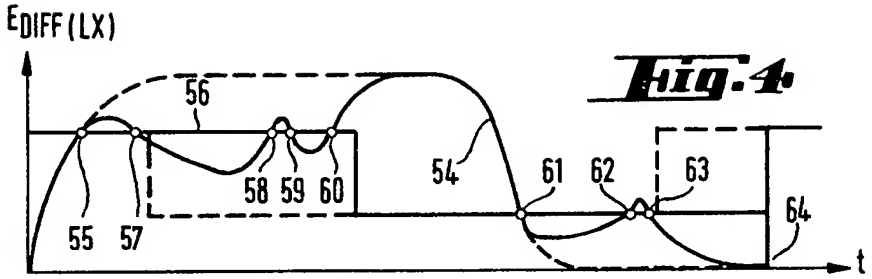

Fig.4

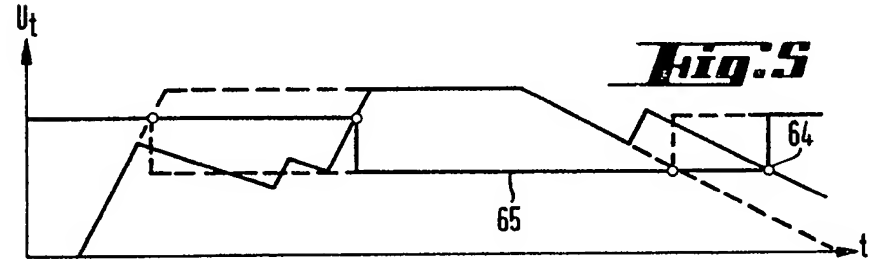

Fig.5

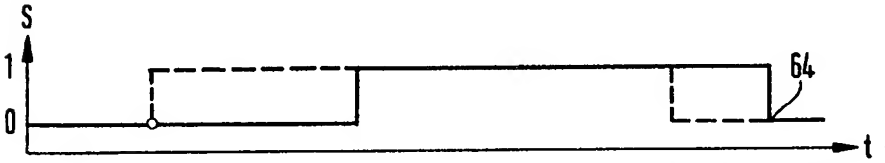

Fig.6

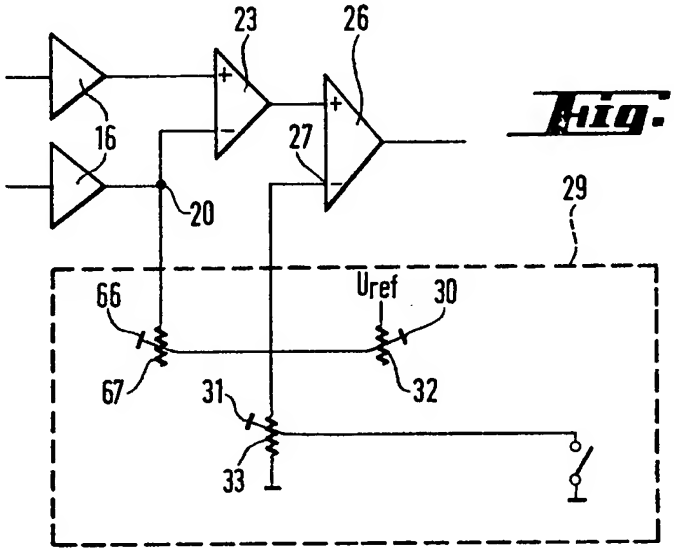

Fig.7

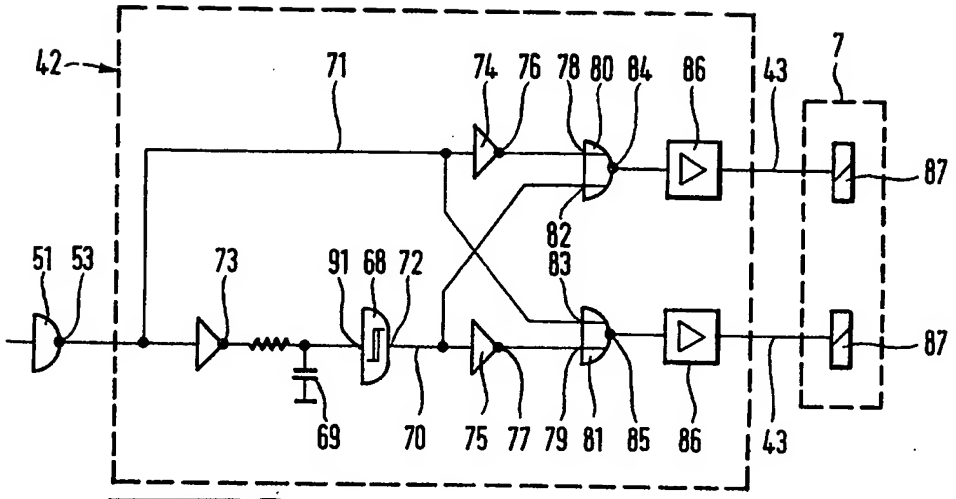
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Fig.8

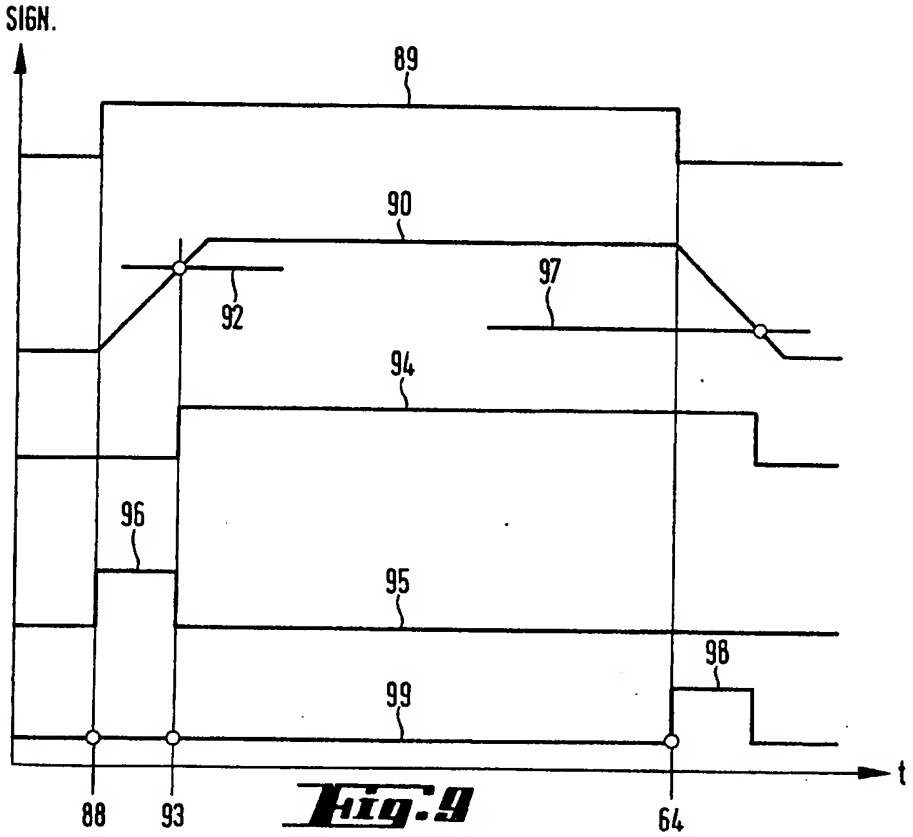
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Fig.9

SPECIFICATION

Apparatus for determining the dazzle effect of a light source

The present invention relates to apparatus for determining the dazzle effect of a light source, having measuring devices to establish the ambient brightness, and the brightness of a source of dazzling light, comprising means for forming the difference between the output signals of the measuring devices, a time-lag device post-connected to the differentiator means and an adjusting device for the dazzle threshold values.

Means for determining the dazzle effect of a light source are already known as described in Austrian Patent Specification No. 321 132, which in their embodiment as measuring devices for determining the ambient brightness or the brightness of a source of dazzling light, comprise photosensitive receptors. To establish the dazzle threshold values, these photosensitive receptors are co-ordinated with an adjustable resistance rendering it possible to emit an output signal after the preset dazzle threshold value has been exceeded which, for example via a relay, causes a supply of current to flow to the winding of an electromagnet of a servo drive for a rearview mirror. If the dazzle threshold value preset by means of the adjustable resistance is not reached, the action on the electromagnet is interrupted and the reflector panel of the rearview mirror is returned to its initial position. For adaptation of the apparatus as a whole to the changing lighting conditions by day and night, this apparatus also has other photosensitive receptors which in conjunction with an electronic circuit array of the servo drive allow of a displacement only once darkness has set in and only when a dazzle threshold value causing a dazzling effect on the eye has been reached.

In another known apparatus for determining the dazzle effect of a light source, according to German Offenlegungschrift No. 3 041 692, two photosensitive receptors are connected in parallel, which are connected to inputs of a "differentiator" device. An adjustable resistance and a capacitor connected in parallel therewith, are arranged between the photoelectric receptor acting as a measuring device for determining the brightness of a source of dazzling light, and the differentiator device. The action of the adjustable resistance and of the capacitor is that brief dazzling actions cannot cause any deflection of a reflector panel of a hinged rearview mirror. The output signals of the differentiator device are fed via a threshold value switch to the driving means of a displacing mechanism for the reflector panel of the hinged rearview mirror, to which end the dazzle threshold value of the dazzle threshold value switch may be adjusted to a predeterminable value. The mensuration signals for determining the ambient brightness and the brightness of a source of dazzling light are scanned sequentially by a photoelectric receptor which is aligned in the direction of an expectable source of dazzling light. Consequently, this photoelectric receptor is commonly pointed in the directon opposite to that of travel. If two photoelectric receptors are provided for separate detection of the brightness of a source of glare and of the ambient brightness, one photoelectric receptor may be aligned in the direction of travel and the other intended to determine the brightness of a source of glare may be pointed in the direction opposed to that of travel.

It is an object of the invention to provide apparatus for determining the dazzle effect of a light source, whereby a reading may be obtained in an adaptation of optimum precision to the human eye regarding the period of intervention of a dazzling action, in particular of an eye adaptation dazzle effect. The output signals of the apparatus should simultaneously be utilisable for actuation of servo drives for displaceable reflector panel of a rearview mirror. Furthermore, the apparatus should emit mensuration signals only if a dazzle effect on the eye caused by its adaptive reaction appears to be possible in view of the ratio between ambient brightness and the brightness of the source of dazzling light or glare.

Accordingly, the invention consists in apparatus for determining the dazzle effect of a light source, having measuring devices to establish the ambient brightness and the brightness of a source of dazzling light or glare, comprising means for forming the difference between the output signals of the measuring devices, a time-delay device post-connected to the differentiator means and an adjusting device for the dazzle threshold values, wherein the setting device is associated with a comparator element situated between the differentiator device and the time-delay device and having input terminals connected to the output terminals of the differentiator means and of the setting device for the dazzle threshold values, and wherein the setting device has a setting element for lowering the dazzle threshold value, which is actuated via a switching element if a signal indicating a dazzle effect is present at the output terminal of the time-delay device.

By adjunctive switching of another setting element to the input side of the differentiator means after detection of the appearance of a source of dazzling light or glare, it is accomplished that the switching threshold is reduced by an appropriate value notwithstanding the signals of the measuring devices, within the apparatus for establishing the dazzle effect of a light source, to a level at which no dazzle effect occurs on the eye when said level is reached. Advantageously, it is accomplished thereby that it is only when the brightness of the source of glare has dropped below this predetermined value that the absence of a dazzle effect is indicated, meaning that an adjustable reflector panel of a rearview mirror is moved back to a normal position from a deflected position. Due to this arrangement of the setting element, it is possible moreover in uncomplicated manner to make allowance for the different adaptive characteristics of human eyes, so that the apparatus for determining the dazzle effect of a light source may be adapted in simple manner to the sight characteristics of different people.

Two setting elements connected in parallel, as well as a threshold value switch, may be post-connected to the output side of the differentiator

means and the time-delay device, respectively, and the two setting elements may be connected to the input side of the threshold value switch via oppositely polarised diodes as well as a capacitor connected in parallel. Due to this uncomplicated circuitry arrangement, it is accomplished that in case of fluctuating brightness of the source of glare, the onset of a dazzle effect is indicated only when the brightness of the source of glare has exceeded the preset threshold value during a presettable period, by virtue of the uniform delay of the input signals. Due to the two adjustable setting elements it is possible moreover to adapt the delay prior to the onset or termination of the indication of a dazzle effect, to different eye adaptation speeds. At the same time, this special circuit interlinkage enables an opposed homopolar signal of adjustable duration to be present at the output side of the time-lagging device, which may be co-opted directly for actuation of a drive of a deflector device for a rearview mirror or for the switching member for actuation of the complementary setting element for reducing the glare threshold after intervention of a dazzle effect.

It is possible furthermore for the setting device to comprise two setting elements, e.g. formed by adjustable voltage dividers, of which one may be switched on via a switching contactor of the switching element, e.g. a relay, and for a drive of the switching element to be connected to an output terminal of the threshold value switch of the time-lagging device, and for the drive of a deflector device for a rearview mirror to be preferably connected to this output terminal. Due to this circuit arrangement, the reducton of the glare threshold within the regulator circuit can be undertaken only once a dazzle effect has actually occurred and for example when the reflector panel of a rearview mirror has also been displaced into a dazzlefree position via the deflector device.

Provision is made according to another embodiment of the invention, for the setting device to comprise another setting element, e.g. formed by an adjustable voltage divider, which has its input side connected to the output side of the ambient brightness measuring device. Due to this circuit interlinkage, the ambient brightness can assume a decisive influence on the detection of the onset of a dazzle effect, in an unexpectedly uncomplicated manner. Above all, the difference between the output signals of the measuring devices becomes even smaller as the ambient brightness increases, until it can no longer exceed the threshold value established by the setting device. A signal in respect of the appearance of a dazzle effect, or an automatic acutuating of a reflector panel of an automatically deflectible rearview mirror, is prevented at a particular level of ambient brightness.

Advantageously an energiser circuit may be situated between the drive of a deflector device and the output side of the time-delay device, which preferably comprises two signal inverters connected in parallel, of which one is connected directly and the other via an inverter to the output side of the timedelay device, and these may have post-connected to them two NOR elements, the two input terminals of the NOR elements being coupled to the output terminal of the preconnected signal inverter as well as to the conductor leading to the signal inverter cnnected in parallel. In this way, the mensuration signals coming from the time-lagging device may be co-opted in rapid and uncomplicated manner for actuation of indicator or deflector devices.

The input terminals of the differentiator device may have connected to them the output terminals of amplifiers whose input terminals are connected to the output terminals of photodiodes for detection of the ambient brightess or of the brightness of a source of glare. This allows photodiodes to be used which offer good value and have considerable durability, for determining the brightness.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings which illustrate certain embodiments thereof by way of example and in which:-

Figure 1 shows an apparatus in accordance with the invention, for determining the dazzle effect of a light source, comprising a rearview mirror coordinated with the same and having a displaceable reflector panel, in sideview,

Figure 2 shows a block wiring diagram of the apparatus in accordance with the invention, intended to determine the dazzle effect of a light source,

Figure 3 shows a block wiring diagram of a time-delay device of the appartus according to Figure 2, to an enlarged scale,

Figure 4 shows a graph illustrating the path followed by the differential signal of the intensity of illumination as compared to the output signals of the time-delay device,

Figure 5 shows a graph illustrating the output signals of the time-delay device as compared to the path followed by the voltage at the input terminal of a threshold value switch,

Figure 6 shows a graph showing the initial state of the time-delay device with respect to the energiser circuit device,

Figure 7 shows a modified embodiment of the setting device for the comparator element of the apparatus according to the invention, in accordance with Figure 2,

Figure 8 shows a block wiring diagram of the energiser circuit of the apparatus in accordance with the invention intended to determine the dazzle effect of a light source, and

Figure 9 shows a graph having several characteristic traces, illustrating the switching conditions in the conductors for action on the energiser circuit device.

Referring to the drawings, apparatus 1 for determining the dazzle effect of a source 2 of glare is illustrated in Figure 1. This apparathus 1 is installed in a casing 3 of a rearview mirror 4, which has a wedgeshaped reflector panel 5 which is pivotable from the raised position shown by solid lines into a dipped position shown by dashed lines by means of a deflector device 6 via a drive 7. This rearview mirror 4 may be installed in a vehicle at an optional point, either inside or outside, as well as for the most diverse purposes of observation. Instead of the

rearview mirror 4, it is evidently also possible to install appropriate measuring devices, recording apparatus or indicator systems, whereby the appearance of a dazzle effect may be detected or indicated or recorded. Such measuring devices are primarily applied to establish the behaviour of the eye under conditions of dazzle.

A measuring device 8 is situated in a sidewall of the casing 3 of the rearview mirror 4 - that is at right angles to the direction of travel of the vehicle - to determine the ambient brightness, whereas a measuring device 9 intended to establish the dazzle effect of the source 2 of glare and orientated in the direction of operation of the reflector panel 5, is situated above the reflector panel 5. The output terminals 10, 11 of the measuring devices 8,9 formed by photodiodes 12, are connected to the apparatus 1. The apparatus 1 has a conductor 13 for supply of power or for onward transmission of messages or data from the apparatus 1 to other devices within the vehicle, for example for automatic turning on or off of the lighting system or for actuation of appropriate warning means.

The block wiring diagram of the apparatus 1 is shown in Figure 2. The output terminals 10, 11 of the measuring devices 8, 9 which may be in the form of photodiodes 12 as shown, are connected to input terminals 14, 15 of amplifiers whose output terminals 17, 18 are connected via conductors 19, 20 to two input terminals 21, 22 of a differentiator means 23. An output terminal 24 of this differentiator means is coupled to an input terminal 25 of a comparator element 26. The second input terminal 27 has connected to it an output terminal 28 of a setting device 29. This setting device incorporates two setting elements 30, 31 formed by two adjustable voltage dividers 32, 33. The setting of the voltage divider 33 does not become effective until a switching member 34, e.g. a relay 35 has been energised and a switching contactor 37 has been closed by means of a drive 36. An output terminal 38 of the comparator element 26 is connected via a conductor 39 to the input terminal 40 of a time-delay device 41. The setting device 29 and an energiser circuit device 42 whereof the output terminal 43 is connected to the drive 7 for the displacement of the reflector panel 5, are connected to the output terminal 53 of this time-delay device 41.

The time-delay device 41 is illustrated in particular in Figure 3. Two setting elements 44, 45 which may be formed by adjustable voltage dividers 46, and which are connected in parallel, are connected to the input terminal 40 of the time-delay device 41. The two voltage dividers 446 have post-connected to them diodes 47, 48 which are oppositely polarised. The output terminals of the two dioes 47, 48 are joined together into one conductor 49, to which are connected an input terminal 50 of a threshold value switch 51, as well as a capacitor 52. An output terminal 53 of the threshold value switch 51 simultaneously forms the output terminal of the time-delay device 41.

Figure 4 illustrates a graph showing the path followed during a particular period by the differential signal of the intensity of illumination as compared to the output signals of the time-delay device 41.

A characteristic trace of the output signal of the time-delay device 41 as compared to the voltage graph at the input terminal 50 of the threshold value switch 51, as illustrated in Figure 5.

A characteristic trace depicting the switching state in the conductor for actuation of the drive 7 for displacement of the reflector panel 5 is shown in Figure 6.

The operation of the apparatus 1 in accordance with the invention is described in particular with reference to the graphs in Figure 4 to 6 in conjunction with the circuit diagrams in Figures 2 and 3.

The photodiodes 12 of the two measuring devices 8, 9 are energised by the ambient brightness or by the source 2 of glare and emit a photo current proportional to the intensity of illumination. This small photo current is amplified in amplifiers 16 and converted into corresponding voltages. The amplification selected in the amplifiers 16 is preferentially chosen in such manner as to yield a sensitivity of 0.5 V per 1 Lux of intensity of illumination. The output voltages of the amplifiers 16 are fed to the two input terminals 21, 22 of the differentiator means 23. The difference between the two voltages is established therein. This differential signal is then fed to the input terminal 25 of the comparator element 26. The output signal of the differentiator means 23 is compared in this comparator element 26 to a datum voltage applied to the input terminal 27.

In the case in which the voltage at the input terminal 25 does not exceed the datum voltage at the input terminal 27, this reference voltage at the input terminal 27 is established by means of the setting element 30. The voltage divider 32, preferably being an adjustable potentiometer, is adjusted in such manner that the output terminal 38 of the comparator element is activated only when a dazzle effect prevails for an eye and a corresponding difference between the ambient brightness and the brightness of the source 2 of glare is operative. If the input voltage at the input terminal 25 is higher than the datum voltage at the input terminal 27, the comparator element 26 which is preferably constructed as a comparator, transmits a signal to the input terminal 40 of the time-delay device 41.

As will be apparent from Figure 4, the difference between the ambient brightness and the brightness of the source 2 of glare represented by the trace 54, exceeds the switching threshold 56 for the first time at the point 55. If the time-delay device 41 were to be absent, the reflector panel 5 would already be pivoted from its raised to its dipped position at this instant. To prevent this, the signal fed to the input terminal 40 of the time-delay device 41 is transmitted onwards via a setting element 44 and a diode 47 to a threshold value switch 51. The voltage increase at the input terminal 50 of the threshold value switch 51 is delayed in accordance with the characteristic of the capacitor, by means of the capacitor 52 connected in parallel. A gradual voltage increase corresponding to the illustration in Figure 5 is caused thereby at the input terminal 50. If the differential brightness drops below the switching threshold 56, the capacitor 52 is discharged with greater or lesser

speed via the oppositely polarised diode 48, depending on the adjustment of the setting element 45. This prevents pivoting the reflector panel 5 into its dipped position prematurely. A displacement then occurs only when the vehicle is so close that a constant dazzle effect is caused by the source 2 of glare of the following vehicle. Fluttering of the reflector panel is prevented in this manner in the case of more distant sources of glare, in which the source 2 of glare frequently disappears after a brief dazzling action and reappears again as frequently occurring during normal driving along bends or changes in road levels. A situation of this kind is illustrated by the points of intersection 57,58; 59,60 between the trace 54 and the switching threshold 56. The voltage level drops between the points of intersection 57,58; 59, 60, as shown in Figure 5, whereas it rises between the points of intersection 58 and 59.

If the diode 48 and the setting element 45 were omitted, this would cause dipping of the reflector panel no later than in the area of the point of intersection 57, as denoted by dashed lines in Figures 4, 5 and 6. It is only after passing beyond the differential brightness/switching threshold point of intersection 60, after which the differential brightness increases again, that the capacitor 52 is charged to such degree that the voltage at the input terminal 50 exceeds the switching threshold of the threshold value switch 51, as depicted in Figure 6 by solid lines. At this instant, the reflector panel 5 is then situated in the dipped position, whereas the setting element 31 is actuated at the same time by the appearance of an output signal at the output terminal 53, via the switching element 34. By means of this setting element 31 and of its setting, the datum voltage at the input terminal 27 of the comparator element 26 is reduced to a level such that the source 2 of glare no longer causes dazzle when the signal at the input terminal 25 does not reach this datum voltage. A substantially improved adaptation of the characteristic of the apparatus 1 according to the invention to the dazzle characteristic of the eye is thereby obtained. If the differential signal of the intensity of illumination then amounts to less than the reduced switching threshold 56 at the point of intersection 61, an analogous effect occurs to that already described prior to the dipping of the reflector. Due to the action of the capacitor 52 and its charging, the displacement of the reflector panel into its raised position is delayed, since the voltage at the input terminal 50 diminishes but gradually, or as soon as the differential intensity of illumination again exceeds the switching threshold, it rises again between the points of intersection 62, 63. The action already referred to earlier regarding the raising operation, meaning that raising the reflector would already occur in the area of the point of intersection without this time-delay device, and that in the absence of the two diodes 47, 48 connected in parallel and of the setting elements 44, 45, the raising action would occur at least in the area of the point of intersection 63 as denoted by dashed lines, also occurs in this case. Due to the arrangement according to the invention of the time-delay device 41, the raising action does not occur until the instant 64 however, since it is only then that the voltage at the input terminal 50 of the threshold value switch 51 drops below the switching threshold 65 of the threshold value switch 51. For example, the signal at the output terminal 53 of the threshold value switch 51 is thereby interrupted, so that the reflector panel is moved back into its normal position whilst simultaneously opening the switching contactor 37 of the switching element 34, thereby restoring the switching threshold 56 to its initial setting.

Due to this particular arrangement of the apparatus 1 according to the invention, it is assured that a signal is emitted or rather that the reflector panel of a rearview mirror is dipped if a glare level appears which could lead to adaptive dazzle of the eye. An adaptive dazzle of the eye intervenes it the level of eye adaptation incurs a field effect due to sudden variation of the ambient light density and of the glare level in the line of sight. To this end, briefly operative brightness differences are of lesser importance than a constant and substantially increased glare level at the eye. The time-delay device 41 was incorporated to prevent such brief glare level variations from leading to repeated dipping and raising of the rearview mirror and thereby to a continuous variation of the conditions of illumination in the area of the eye. The adaptive dazzle phenomenon, characterised by the appearance of the "black hole" and very dangerous whilst driving at night, is thereby averted. This "black hole" actually causes previously discernible details to become invisible. This is the more dangerous for the driver's competence to drive in the case of being dazzled via a rearview mirror, since the source of glare lies closer to the focal point and the adjacent regions excited particularly intensively by the light diffused in the eye diminish the focal function of the eye.

Consequently, the apparatus 1 renders it possible to reduce the risk of dazzle which in the case of a punctiform light source rises with the 3rd power of the intensity of illumination of the course of glare. Large steering wheel movements which frequently cause collisions may consequently be reduced, since the adaptive dazzle effect causing a reticular activation and leading to disturbance of the precise focussing action in the eye and to random movements, is eliminated.

It will be apparent from Figure 7 that the setting device 29 is additionally provided with another setting element 66 which may also be formed by an adjustable voltage divider 67. This setting element 66 is connected to the input terminal 27 of the comparator element 26 together with the setting elements 30 and 31.

Whereas the setting element 30 serves the purpose of feeding an equal portion of a datum voltage to the input terminal 27 of the comparator element 26 via the voltage divider 32 at an ambient brightness level practically equal to zero, the setting element 31 serves the purpose of lowering the switching threshold 65 - Figure 5 - by means of the voltage divider 33 when the reflector panel is dipped, in such manner that the risk of adaptive dazzing of the eye is excluded upon raising the reflector panel. The level of the ambient brightness is henceforth

also included in the reference or datum voltage at the input terminal 27, by means of the setting element 66. This occurs in such manner that the voltage is tapped off the conductor 20 and that allowance for the same is made in the datum voltage at the input terminal 27 as a function of the ratio set on the voltage divider 67. It is assured thereby that the glare threshold is higher as the ambient brightness increases, since the source of glare should obviously have a higher intensity of illumination in case of a greater ambient brightness, to result in dazzling an eye.

In combination with the further embodiment of the apparatus in accordance with the invention, it is ensured that the actuation of an apparatus 1 of this nature, or rather of a drive 7 for dippling a reflector panel 5 does not occur until the ambient brightness has diminished so that the eye is adapted to darkness and that a source of glare appears with a glare level commensurate with the ambient brightness. For example, if the roadway is lit comparatively brightly at night by the street lighting system, a dazzling effect will occur only if a correspondingly high glare level is operative. On the other hand, oncoming vehicles may have caused the iris of the eye to contract because of dazzle, so that so displacement of the mirror should occur in the case of complementary dazzle from behind. In order that allowance may also be made for the adaptation of the eye caused by the lighting conditions established by oncoming vehicles, the photodiode determining the ambient brightness may if appropriate also be aligned approximately in the direction of travel, or another photodiode may be installed in the direction of travel to determine the ambient brightness.

The connections in respect of mensuration and control technology between the light intensity of adaptation and the minimum light density difference should however primarily be allowed for in the case of a particular objective exposure period, upon designing the apparatus in accordance with the invention. If a street lighting intensity of 1 asb is now assumed as a practical instance, the minimum still discernible light intensity difference for a corresponding detail amounts to say 0.03 asb. If a vehicle is then driven at a distance of 30 metres on this road for example, the headlights having an intensity of illumination of 810 cb and thereby causing a light level of 0.9 lx in the eye, the "fogging" light intensity transmitted by the rearview mirror is calculated as Bs = 0.56 asb.

In the case of the resultant adaptive light intensity of 1.56 asb, it is discovered that the minimum light intensity difference of a still discernible detail must amount to approximately 0.04 ash because of the source of glare; the detail discernible at 0.03 asb still discernible in the forward direction without dazzle, has become invisible due to dazzle via the rearview mirror. These deleterious actions may thus be averted by appropriate construction of the switching system according to Figures 1 to 5.

Beyond this, it may be accomplished by appropriate design of the amplifiers 16 post-connected to the measuring devices 8,9 that the output voltages of the two amplifiers may increase only up to a particular maximum value, e.g. approximately 4.5 volts = 9 Lux, i.e. as the ambient brightness increases, the maximum possible difference between the output of the two amplifiers 16 becomes even smaller, until the datum voltage at the input terminal 27 of the comparator element 26 can no longer be exceeded. It is accomplished thereby, without having to actuate switching elements or the like, that a dazzling action is observed only up to a particular ambient brightness or that in the case of dippable rearview mirrors, the reflector panel 5 is displaced into a dipped position.

The form of embodiment of the energiser circuit 42 is shown morover to enlarged scale in Figure 8. Due to application of a threshold value switch 68 comprising two switching thresholds established symmetrically with respect to a mean voltage value, it is possible to obtain two consecutive signals in the case of a switching state variation in conjunction with the capacitor 69 preconnected to this threshold value switch 68. The two conductors 70,71 which are connected to the output terminal 72 of the threshold value switch 68 which has preconnected to it an inverter 73, or to a conductor coming from the output terminal 53 of the threshold value switch 51, are connected to two signal inverters 74, 75 which are connected in parallel with each other. The output terminals 76, 77 of the signal inverters 74, 75 are in each case connected to an input terminal 78, 79 of two post-connected NOR elements 80,81. Another input terminal 82 of the NOR element 80 is connected to the conductor 70 and another input terminal 83 of the NOR element 81 is connected to the conductor 71.

The output terminals 85, 84 of the NOR elements 80,81 are connected via the two power driver stages 86 to the post-connected drive of the driving mechanism 6 of the rearview mirror 4. This drive 7 comprises two electromagnets 87 which are utilised for moving the reflector panel 5 into a dipped position or back into the normal position. In doing so it is also accomplished as will also be described with reference to the diagrams aparent from Figure 7, that signals are transmitted via the two NOR elements 80,81 during a predetermined switching period for action on the electromagnets 87.

The operation of this driver circuit device is illustrated in pulsed manner in Figure 9, by means of a pulse graph.

The operation of this driver circuit device is then as follows:

A signal variation is carried out in conductor 71 as shown by characteristic trace 89 at the instant 88 by means of the output signal at the output terminal 53 of the threshold value switch 51. It is apparent moreover from a characteristic 90 showing the voltage graph at an input terminal 91 of the threshold value switch 68 that the voltage at this input terminal 91 increases with a particular time lag because of the action of the capacitor 69. Consequently, there is no signal at the instant 88 at the NOR element 80 due to the action of the preconnected signal inverter 74 either at the input terminal 78 as well as at the input terminal 82, and an action on one of the electro-magnets 87 is initiated. If then

the voltage 90 has increased according to the characteristic of the capacitor 69, to the extent that the upper threshold value 92 of the threshold value switch 68 is exceeded, a variation of the switching state of the conductor 70 occurs at the same instant 93 as apparent from the characteristic 94. This terminates the activation of the drive 86, as denoted by the pulse 96 on the characteristic line 95. If the signal at the output terminal 53 of the threshold value switch 51 is then interrupted at the instant 64 according to the illustration in the graph according to Figure 6, a variation intervenes in the switching state of the conductor 71 as apparent from the excursion 89 at the instant 64. By delaying the pulse emission from the threshold value switch 68 by means of the capacitor 69, this delays the signal emission or state variation in the conductor 70, until the constantly diminishing voltage has dropped below the switching threshold 97. This thereupon causes termination of the action on the electromagnet 87 as denoted by the pulse 98 at a characteristic line 99. This circuitry ensures that an action on the electromagnets may be secured without a thermal overload of the same and with a reliable final deactivation, due to the availability of pulses of appropriately long duration.

CLAIMS

1. Apparatus for determining the dazzle effect of a light source, having measuring devices to establish the ambient brightness and the brightness of a source of dazzling light or glare, comprising means for forming the difference between the output signals of the measuring devices, a time-delay device post-connected to the differentiator means, and an adjusting device for the dazzle threshold values, wherein the setting device is associated with a comparator element situated between the differentiator device and the time-delay device and having input terminals connected to the output terminals of the differentiator means and of the setting device for the dazzle threshold values, and wherein the setting device has a setting element for lowering the dazzle threshold value, which is actuated via a switching element if a signal indicating a dazzle effect is present at the output terminal of the time-delay device.

2. Apparatus as claimed in claim 1, wherein the output terminal of the comparator element has post-connected to it two setting elements connected in parallel, as well as a threshold value switch of the time-delay device, the two setting elements being connected to the input terminal of the threshold value switch via oppositely polarised diodes and a capacitor connected in parallel.

3. Apparatus as claimed in claim 1 or 3, wherein the setting device has two setting elements one of which is energisable via a switching contactor of the switching element, and wherein a drive of the switching element is connected to an output terminal of the threshold value switch of the time-delay device.

4. Apparatus as claimed in claim 3, wherein a drive of a dipping mechanism for a rearview mirror is connected to the output terminal of said threshold value switch.

5. Apparatus as claimed in claim 3 or 4, wherein the setting elements are constituted by adjustable voltage dividers.

6. Apparatus as claimed in claim 3, 4 or 5, wherein the switching element is controlled by a relay.

7. Apparatus as claimed in any of the preceding claims, wherein the setting device includes a further setting element, which has its output terminal connected to the output terminal of the ambient brightness measuring device.

8. Apparatus as claimed in any of the preceding claims 4 to 7, wherein, between the drive of the dipping mechanism and the output terminal of the time-delay device, is located an energiser circuit device which comprises two signal inverters connected in parallel, of which one is connected directly and the second via an inverter to the output terminal of the time-lag device and wherein the same have post-connected to them two NOR elements, the two input terminals of the NOR elements being connected to the output terminals of the preconnected signal inverter as well as to a conductor leading to the signal inverter connected in parallel.

9. Apparatus as claimed in any of the preceding claims, wherein the input terminals of the differentiator means have connected to them the output terminals of amplifiers whose input terminals are coupled with the output terminals of photodiodes for determining the ambient brightness or the brightness of a source of glare.

10. Apparatus for determining the dazzle effect of a light source substantially as hereinbefore described with reference to Figures 1 to 6 of the accompanying drawings.

11. Apparatus for determining the dazzle effect of a light source substantially as hereinbefore described with reference to Figure 7 of the accompanying drawings.

12. Apparatus for determining the dazzle effect of a light source substantially as hereinbefore described with reference to Figure 8 of the accompanying drawings.

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